

where reproduction is proceeding most actively. Fig. 5 is a large flask containing a fluid culture through which air was passed continuously while the photograph was taken.

My investigations on these organisms have been carried out at the Jenner Institute of Preventive Medicine, and I am greatly indebted to Dr. Allan Macfadyen for help and advice during the progress of the work.

J. E. BARNARD.

INTERNATIONAL COMMITTEE OF WEIGHTS AND MEASURES.

THE International Committee of Weights and Measures at Paris has just issued an account of its business and proceedings for the past year.¹ It would appear from the report of the director of the International Bureau (at Sèvres, near Paris), made to the Committee at their session in October last, that the work of the Bureau has, under the directions of the Committee, included:—Research as to the mass of a cubic decimetre of water (giving for the specific mass of water at 4° C. a value equal to 0.9999707); the study of dividing engines; investigations, as to the dilatation of metals, the precise measurement of temperature, &c. The ordinary verification work of the Bureau during the past year has included:—The re-verification of metric standards (metres and kilogrammes) for the High Contracting States who have given adhesion to the Metric Convention, 1875; the verification of standards (particularly thermometers, and decimetres) for a large number of scientific and official authorities; and the installation of new bases for geodetic measurements. We are glad to see that the Committee has now been able to extend and repair its laboratories at the Pavillon de Breteuil and to perfect its arrangements for undertaking electrical measurements.

We congratulate the new secretary of the Committee, Prof. P. Blazerna (Rome); who has succeeded the late secretary the lamented Dr. A. Hirsch; on the present issue of the *Proceedings* of the Committee. Four useful appendices are attached to the volume, including:—Annexe i., on the danger of introducing normal secondary standards in the definition of metric units; a *résumé* (annexe ii.) of legislation in different countries, derived from reports presented to both Houses of Parliament by the British Foreign Office in 1900 and 1901; and particularly annexe iv., which recapitulates the decisions of the Troisième Conférence Générale held at Paris last October, as to the definition of the metric units, metre, kilogramme and litre, and the true measurements of standards of those units. The Committee also was much engaged in the discussion of these definitions, which are now published in the *Compte rendu des Séances de la Conférence* (Paris, 1901).

The members of the Committee included MM. Arndsten, D'Arrillaga, Benoit, Blazerna, De Bodola, Chaney, Cornu, Egoroff, Gautier, Hasselberg, Hepites, Von Lang, De Macedo; and M. Mendeléeff, formerly an active member of the Committee, has now been named one of the honorary members of the Committee.

Last year the annual budget of the Committee was, as in previous years, fixed at 75,000 francs; but at the meeting at Paris in October 1901 of the General Conference it was proposed that the budget should be increased to 100,000 francs annually. This proposition did not, however, receive the support of the delegate from Great Britain, but we are now glad to see that the Treasury has given its sanction for the increase in the proportionate contribution payable by this country to the Committee, based on the annual budget of 100,000 francs.

¹ "Comité International des Poids et Mesures." *Procès Verbaux*. Pp. 781. (Paris: Gauthier Villars, 1902.) 1 vol.

SIR JOHN DONNELLY, K.C.B.

SIR JOHN DONNELLY, whose death occurred on Saturday last after a painful illness of more than six weeks, will probably be best remembered for his unceasing and devoted service in developing and administering Governmental schemes for the promotion of scientific education in this country. Soon after the end of the Crimean War, through which he served with distinction as a Lieutenant of Royal Engineers, being twice mentioned in despatches and recommended for the Victoria Cross—an honour, however, rather unjustly withheld from him—he was appointed to the charge of a detachment of Royal Engineers quartered at the South Kensington Museum. At that time this institution was but newly born, under the fostering care of the Department of Science and Art, the principal permanent chief being Sir Henry Cole, who formed the highest opinion of Donnelly's marked abilities as a clear-sighted, shrewd and wholly trustworthy young officer. About 1858–1859, Captain Donnelly succeeded the late Lord (then Dr.) Playfair as inspector for science, and a general scheme of grants applicable to the whole country was formulated and set in operation. The subjects of science towards which instruction in aid was obtainable were at first few. Among the examiners was Huxley, with whom Donnelly came to be closely associated. This close association ripened into an intimate and affectionate friendship. It is probable that to few, if any, other men did Donnelly turn with equal confidence for counsel and advice more frequently than he did to Huxley.

From a beginning of thirty-eight local science classes and schools with 1330 students in 1860 were developed the existing 2000 classes and schools attended by at least 160,000 students. Grants for practical work in laboratories at such schools were made by the Government in 1870. As early as 1867 Donnelly had a large share in putting forward a scheme for aiding local efforts to establish local scholarships and exhibitions to assist the higher instruction of students in science.

Besides the management and care of these wide-reaching operations, he assisted in reorganising the old Royal College of Chemistry in Oxford Street and the School of Mines in Jermyn Street which became in 1890 the Royal College of Science, of which the first dean was the late Prof. Huxley. In 1868 Donnelly was appointed on a commission to consider what steps should be taken to constitute a separate Department of Science and Art for Ireland, and, acting also as secretary of the commission, he drafted its report. The commission could not see its way to reporting in favour of establishing a separate Department, and up to Donnelly's retirement in July 1899 various State-aided institutions in Ireland were subject generally to his control as Secretary of the Science and Art Department, to which office he was appointed in 1884, having held the office of Director for Science from 1873.

To develop the Museum of Science as a worthy companion to the Museum of Art at South Kensington, Donnelly pressed upon the notice of his chiefs the desirability of holding a very important and successful loan exhibition of scientific instruments and apparatus, which was opened in 1874 by Her Majesty Queen Victoria in person. This led to the formation of a museum of scientific apparatus for teaching and research. For many years after the retirement of Sir Henry Cole in 1873, Donnelly was untiring in his exertions to secure Parliamentary grants for the completion and erection of properly devised permanent buildings to house the Museums of Art and Science, the component sections of which were dispersed throughout in temporary and straggling makeshift galleries and sheds. The obvious scandal that a Government could permit the existence of such a

condition gathered strength. Opponents and friends of the Department of Science and Art approached the scandal from different points of view; and in 1896 a Select Committee of the House of Commons was appointed. No witness before a Select Committee has, it is believed, ever been subjected to such a prolonged course of petty ignorant spite and vexatiousness as Sir John Donnelly was. For months he had to undergo an almost daily crossfire of idle questions. However, the main upshot of the Committee's reports was a vote by Parliament of the handsome sum of 800,000*l.* to complete the permanent science and art buildings at South Kensington, thus securing the very object to obtain which Donnelly had laboured so hard. So far as concerned the relatively unimportant malicious statements and inaccuracies which were aimed at Sir John Donnelly in passages of the Committee's reports, the Lord President and Vice-President of the Council on Education issued a minute animadverting upon them and emphasising the fact that their lordships alone were responsible for the administration of the museums; their directions had been loyally carried out by the staff and they retained the fullest confidence in Sir John Donnelly and his colleagues. There can be little doubt now that the irritation to which the Select Committee's persistent attacks put Sir John told upon his health.

Sensitive and reserved, he had an almost over-exacting sense of rectitude. He did not court society—in the conventional sense—but preferred the exclusiveness of his own circle of friends, which included many men prominent in science and art. During his yearly holidays, chiefly spent in the quiet retirement of his house amongst the pine-woods at Felday, Surrey, he frequently sketched, and season after season one or two of his painstaking etchings and water-colour paintings were to be seen at either the Royal Academy or the New Gallery.

NOTES.

It is too early to estimate fully the effect of the magnificent endowments provided for by the will of Mr. Cecil Rhodes, but we are all able to admire the noble conception which aims at promoting a good understanding between England, Germany and the United States. It would be difficult to suggest a better means of accomplishing this than that outlined by Mr. Rhodes. Students from our colonies, the United States and Germany are to be encouraged to spend three years in the University of Oxford, where they will become familiar with our national characteristics. Nothing but good can come from the friendships which will thus be founded; and there will be a strong influence tending to bring the three nations into close relationship with one another, which will enable political and commercial questions to be discussed without the distrust usually connected with them. Rarely have endowments been made with so lofty an object; and with such an example we look hopefully to the future for other ties to bind nations together. For the present, a brief statement of the provisions of the will as regards education will be sufficient to show the scheme by which this unity of race is to be furthered. Sixty scholarships of 300*l.* a year each are to be founded for colonial students. The scholarships will be tenable at any Oxford college for three consecutive years, and twenty are to be awarded every year, this number being distributed among the various portions of the British Empire. Two scholarships of the same value are allocated to each of the fifty States and Territories of the United States of America. Moreover, in recognition of the encouragement now given in German schools to the study of English, fifteen scholarships of the value of 250*l.*

a year, tenable at Oxford by German students for three years, are to be established. The will thus provides for scholarships amounting to nearly 52,000*l.* per annum, which means a capital sum of from one and a half to two millions. Some of the scholarships would have been made tenable at Edinburgh if the University there had been on a residential system; for Mr. Rhodes mentioned in his will that fifty or more students from South Africa were studying there, many of them attracted by the excellent medical school, but the want of a residential system made him refrain from establishing any scholarships in connection with the University. Oxford, like Cambridge, has such a system, and the will suggests that "it should try to extend its scope so as if possible to make its medical school at least as good as that at the University of Edinburgh." The world will now look to Oxford to increase the value of its medical school, and we shall wait with interest to see what developments are made. Mr. Rhodes's old college at Oxford, Oriel College, receives 100,000*l.*, of which 40,000*l.* is for the erection of new buildings, as a fund to cover the loss to College revenue involved in the removal of houses to make room for them; 40,000*l.* to endow an increase of income of resident fellows working "for the honour and dignity of the College"; 10,000*l.* to increase the comforts of the High Table, and the remaining 10,000*l.* is to be a fund for providing for the maintenance and repair of the College buildings. A sum yielding 2000*l.* a year is set apart for the cultivation of Mr. Rhodes's property at Inyanga, and he directs in particular that irrigation should be the first object kept in view. Other objects to be borne in mind are experimental farming, forestry, market and other gardening, fruit farming, and the teaching of any of those things, and the establishment and maintenance of an agricultural college. Mr. Rhodes's gifts are both bounteous in amount and grand in intention; and they reveal a greatness of character not often found.

MR. GEORGE WILSON, whose death was announced in our last issue, was one of those who early appreciated the immense importance of applying science to manufacturing industries. The results in his case were seen in the excellence of his products and in the importance of the incidental substances which were brought to light in the course of the manufacture. In his days the importance of scientific method and its superiority to rule of thumb were not so much insisted on as they are now. Mr. Wilson was not only a chemist, but an enthusiastic horticulturist, adopting gardening at first as a recreation, and of late years making it the occupation of his life. Although he published nothing but ephemeral notes on his favourite pursuit, he constantly insisted on the necessity of applying scientific principles to practical horticulture. In a very interesting little book entitled "The Old Days of Price's Patent Candle Company," in which the history of the manufactures which resulted in such vast improvements in candle making is detailed, he says: "Laboratory training teaches careful observation and close watching, both useful in gardening, which gives a wide field for experiment. If I read the future aright ten years hence good fruit will be much more general than it is now, and for one beautiful hardy plant now common in our gardens we shall have ten." This forecast was written in 1876, and it has certainly been fulfilled, if not quite in the way that Mr. Wilson had in his mind.

FOUR zoological lectures will be delivered in the meeting-room of the Zoological Society after the general meetings on April 17, May 22, June 19 and July 17. The subjects and lecturers are:—"Flying Reptiles," by Prof. H. G. Seeley, F.R.S.; "Horses and Zebras," by Prof. J. Cossar Ewart, F.R.S.; "The Okapi," by Prof. E. Ray Lankester, F.R.S.; and "Elephants," by Mr. F. E. Beddard, F.R.S.